Title (en)

HOT-ROLLED STEEL SHEET AND PRODUCTION METHOD THEREFOR

Title (de)

KALTGEWALZTES STAHLBLECH UND HERSTELLUNGSVERFAHREN DAFÜR

Title (fr)

TÔLE D'ACIER LAMINÉE À CHAUD ET PROCÉDÉ DE PRODUCTION ASSOCIÉ

Publication

EP 2692893 A4 20141210 (EN)

Application

EP 12762991 A 20120328

Priority

- JP 2011070725 A 20110328
- JP 2012058160 W 20120328

Abstract (en)

[origin: US2014000765A1] This is a cold-rolled steel sheet includes, by mass %, C: 0.02% to 0.4%, Si: 0.001% to 2.5%, Mn: 0.001% to 4.0%, and Al: 0.001% to 2.0%. The sum of the Si content and the Al content is 1.0% to 4.5%. An average pole density of an orientation group from {100}<011> to {223}<110> is 1.0 to 6.5, and a pole density of a crystal orientation {332}<113> is 1.0 to 5.0. A microstructure includes, by an area ratio %, 5% to 80% of ferrite, 5% to 80% of bainite, and 2% to 30% of retained austenite. In the microstructure, by an area ratio %, martensite is limited to 20% or less, pearlite is limited to 10% or less, and tempered martensite is limited to 60% or less.

IPC 8 full level

C22C 38/06 (2006.01); **B32B 15/01** (2006.01); **C21D 8/02** (2006.01); **C21D 9/46** (2006.01); **C22C 38/00** (2006.01); **C22C 38/02** (2006.01); **C22C 38/04** (2006.01); **C22C 38/08** (2006.01); **C22C 38/10** (2006.01); **C22C 38/12** (2006.01); **C22C 38/14** (2006.01); **C22C 38/16** (2006.01); **C22C 38/26** (2006.01); **C22C 38/28** (2006.01); **C22C 38/34** (2006.01); **C22C 38/38** (2006.01); **C22C 38/58** (2006.01); **C22C 38/60** (2006.01)

CPC (source: EP KR US)

B32B 15/013 (2013.01 - EP US); **C21D 8/02** (2013.01 - KR); **C21D 8/0226** (2013.01 - EP US); **C21D 8/0263** (2013.01 - EP US); **C21D 8/0463** (2013.01 - EP US); **C21D 9/46** (2013.01 - EP US); **C22C 38/001** (2013.01 - EP US); **C22C 38/002** (2013.01 - EP US); **C22C 38/005** (2013.01 - EP US); **C22C 38/008** (2013.01 - EP US); **C22C 38/02** (2013.01 - EP US); **C22C 38/04** (2013.01 - EP US); **C22C 38/06** (2013.01 - EP KR US); **C22C 38/08** (2013.01 - EP US); **C22C 38/10** (2013.01 - EP US); **C22C 38/12** (2013.01 - EP US); **C22C 38/14** (2013.01 - EP US); **C22C 38/16** (2013.01 - EP US); **C22C 38/26** (2013.01 - US); **C22C 38/28** (2013.01 - US); **C22C 38/34** (2013.01 - EP US); **C22C 38/38** (2013.01 - EP US); **C22C 38/58** (2013.01 - KR); **C22C 38/60** (2013.01 - EP US); **C23C 2/02** (2013.01 - EP KR US); **C23C 2/0224** (2022.08 - EP KR US); **C23C 2/024** (2022.08 - EP KR US); **C23C 2/06** (2013.01 - EP US); **C23C 2/28** (2013.01 - EP KR US); **C23C 2/40** (2013.01 - EP US); C21D 2201/05 (2013.01 - EP US); C21D 2211/002 (2013.01 - EP US); C21D 2211/005 (2013.01 - EP US); C21D 2211/009 (2013.01 - EP US)

Citation (search report)

- [A] JP 2009030159 A 20090212 - NIPPON STEEL CORP
- [A] JP 2003293083 A 20031015 - SUMITOMO METAL IND
- [A] JP 2001089811 A 20010403 - KAWASAKI STEEL CO
- [A] EP 1201780 A1 20020502 - NIPPON STEEL CORP [JP]
- See references of WO 2012133540A1

Cited by

DE102014017273A1; DE102014017274A1; EP4223900A4; US10590504B2; US10253389B2; EP2971209A1

Designated contracting state (EPC)

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

DOCDB simple family (publication)

US 2014000765 A1 20140102; **US 9670569 B2 20170606**; BR 112013024984 A2 20161220; BR 112013024984 B1 20181211; BR 112013025015 A2 20170301; BR 112013025015 B1 20181106; CA 2829753 A1 20121004; CA 2829753 C 20160308; CA 2831404 A1 20121004; CA 2831404 C 20160308; CN 103459647 A 20131218; CN 103459647 B 20150902; CN 103476960 A 20131225; CN 103476960 B 20160427; EP 2692893 A1 20140205; EP 2692893 A4 20141210; EP 2692893 B1 20171220; EP 2692895 A1 20140205; EP 2692895 A4 20141203; EP 2692895 B1 20180228; ES 2655939 T3 20180222; ES 2665982 T3 20180430; JP 5408382 B2 20140205; JP 5408383 B2 20140205; JP WO2012133540 A1 20140728; JP WO2012133563 A1 20140728; KR 101536845 B1 20150714; KR 101549317 B1 20150901; KR 20130123460 A 20131112; KR 20130125821 A 20131119; MX 2013011062 A 20131017; MX 2013011063 A 20131017; MX 338912 B 20160505; MX 338997 B 20160509; PL 2692893 T3 20180530; PL 2692895 T3 20180731; TW 201245465 A 20121116; TW 201247890 A 20121201; TW I447236 B 20140801; TW I452145 B 20140911; US 2014014236 A1 20140116; US 9546413 B2 20170117; WO 2012133540 A1 20121004; WO 2012133563 A1 20121004

DOCDB simple family (application)

US 201214004562 A 20120328; BR 112013024984 A 20120328; BR 112013025015 A 20120328; CA 2829753 A 20120328; CA 2831404 A 20120328; CN 201280015115 A 20120328; CN 201280015543 A 20120328; EP 12762991 A 20120328; EP 12763971 A 20120328; ES 12762991 T 20120328; ES 12763971 T 20120328; JP 2012058160 W 20120328; JP 2012058199 W 20120328; JP 2013507677 A 20120328; JP 2013507685 A 20120328; KR 20137024766 A 20120328; KR 20137025301 A 20120328; MX 2013011062 A 20120328; MX 2013011063 A 20120328; PL 12762991 T 20120328; PL 12763971 T 20120328; TW 101110980 A 20120328; TW 101110982 A 20120328; US 201214007583 A 20120328